

**UNION SWITCH AND SIGNAL  
LOWER LOT SOIL CONTAMINATION ASSESSMENT  
SWISSVALE PLANT**

**PREPARED FOR:**

**UNION SWITCH AND SIGNAL  
SWISSVALE, PENNSYLVANIA**

**PREPARED BY:**

**IT CORPORATION  
MONROEVILLE, PENNSYLVANIA**

**REVISED DECEMBER 10, 1987  
PROJECT NO. 305253**

## INTRODUCTION

Union Switch and Signal (USS) contracted IT Corporation (IT) to perform subsurface soil sampling and analyses at the lower lot located at the Swissvale, Pennsylvania facility. The objective of the program was to determine subsurface soil conditions in the lower lot. IT mobilized a sampling crew on August 14, 1987 and collected 28 soil samples at various locations. This report presents the analytical data and the contamination assessment for the lower lot areas.

### SAMPLING PLAN

IT developed and implemented a subsurface soil sample collection program for the lower lot. The program consisted of the collection of 28 soil samples at various locations (Figure 1) and two depths that included:

- Fourteen soil samples collected at the 6-inch depth
- Fourteen soil samples collected at the 24-inch depth.

A hand auger was used to collect subsurface soil samples. The samples were thoroughly homogenized prior to placement into wide-mouth, amber-colored glass bottles with teflon lids. Sampling equipment was decontaminated by washing with distilled water and wipe drying with paper towels to avoid cross contamination.

The samples were transported to IT's analytical laboratory at Export, Pennsylvania with chain-of-custody records.

### ANALYTICAL PROGRAM

The analytical program for the soil samples collected followed the U.S. Environmental Protection Agency (U.S. EPA) methods outlined in the "Test Methods for Evaluating Solid Wastes," SW-846, 3rd revised edition, 1986. Other methods used were either approved by the U.S. EPA or Standard Methods by American Public Health Association, 16th edition, 1985. A summary of analytical methods is presented in Table 1. The analytical program included:

- Extraction Procedure (EP) toxicity heavy metals
  - Arsenic, barium, cadmium, chromium, mercury, lead, selenium, and silver
  - Chromium VI
- Hazardous Substance List (HSL) organics
  - Volatile organics
  - Semivolatile organics.

The normal IT Quality Assurance/Quality Control (QA/QC) program was followed for the analytical program. The program consists of analyses of blanks, duplicates and spikes with samples analyses.

#### ANALYTICAL RESULTS

Tables 2 to 4 present the analytical data for the subsurface soil samples collected from the lower lot area.

Results for the Resource Conservation and Recovery Act (RCRA) EP toxicity leachate analysis [40 Code of Federal Regulations (CFR) 260.20 and 260.21] performed for heavy metals in subsurface soil are presented in Table 2. Subsurface soil samples collected at a depth of 6 and 24 inches show EP toxicity metal concentrations below the U.S. EPA criteria for hazardous waste.

Table 3 presents the results of volatile HSL organics. Most of the HSL volatiles were below detection limits except acetone in concentration ranges of 100 to 440 milligrams per kilogram (mg/kg) were detected in both 6- and 24-inch-deep soil samples. Acetone is a common laboratory contaminant and its appearance in the subsurface soil is possibly due to laboratory contamination.

Semivolatile HSL analysis results presented in Table 4 show several polynucleated aromatic hydrocarbons (PAHs) present in subsurface soils. Subsurface Soil US-7 collected at a 6-inch depth showed low concentrations of methylnaphthalene (420 mg/kg) and phenanthrene (380 mg/kg). Other 6-inch-deep soil samples showing low concentrations of individual PAHs include US-11 (420 to 1,300 mg/kg), US-17 (500 to 580 mg/kg), and US-21 (480 to 620 mg/kg). The 24-inch-deep soil samples showing detectable PAHs were US-18 (500 to

700 mg/kg) and US-22 (570 to 820 mg/kg). PAHs identified in these samples include benzoanthracene, benzopyrene, benzofluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene.

#### SUMMARY

Subsurface soil samples collected at the lower lot were nonhazardous according to EP toxicity metal standards. Acetone detected in these soils may possibly be due to laboratory contamination. Low concentrations of PAHs were found in subsurface soil at several locations.

By P.L. Date 8/14/87 Subject Union Switch & Signal

Sheet No. \_\_\_\_\_ of \_\_\_\_\_

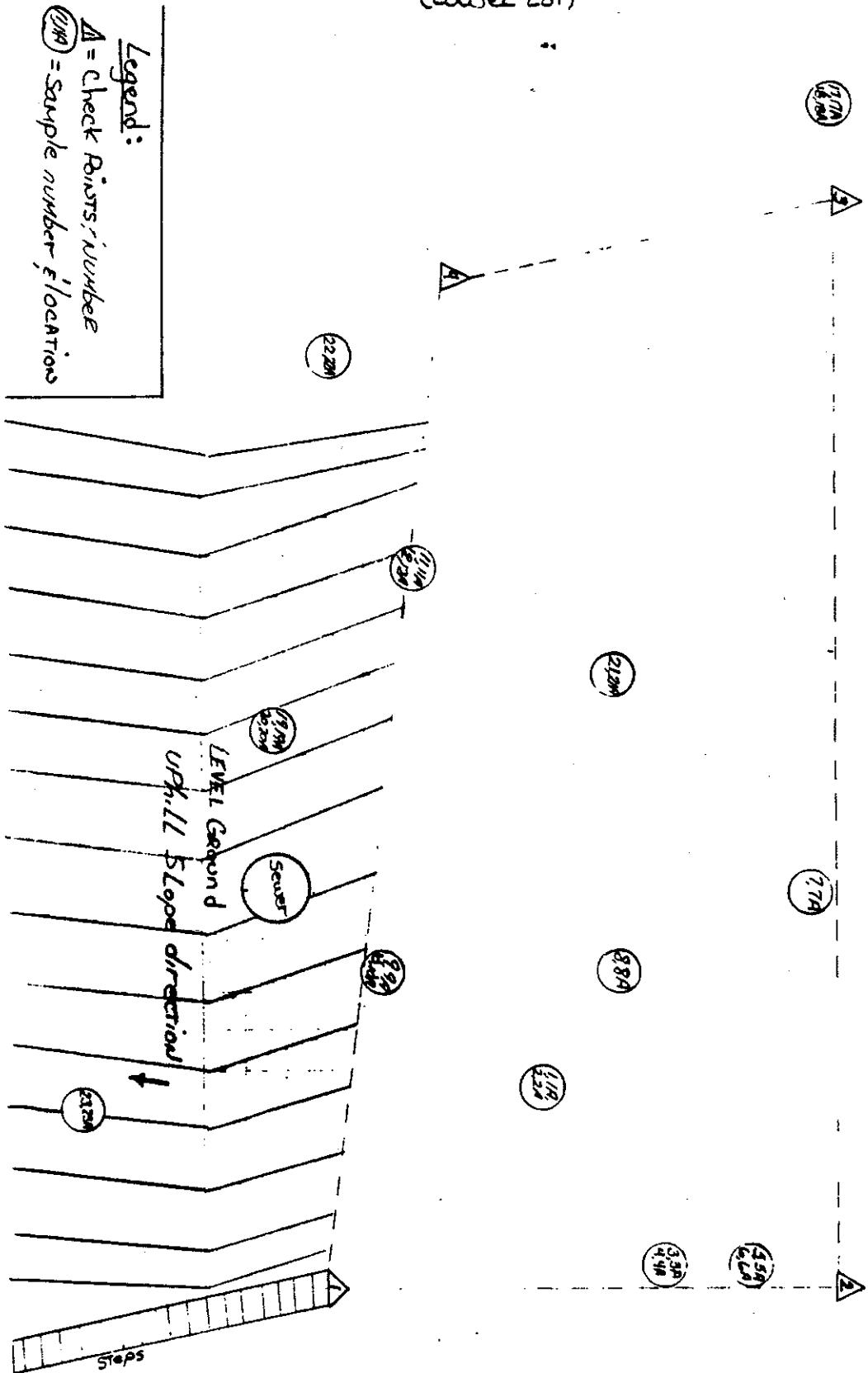
Chkd. By \_\_\_\_\_ Date \_\_\_\_\_ Sample location plot plan  
(Lower Lot)

Proj. No. 305253

Legend:

△ = Check Points, number

(Circles) = Sample number & location



scale: 1 block = 5 feet

FIG. 1

By P.L. Date 8/4/87 Subject Union Switch & Signal

Sheet No. \_\_\_\_\_ of \_\_\_\_\_  
Proj. No. 305253

Chkd. By \_\_\_\_\_ Date \_\_\_\_\_ Upper Lot

Legend:

(1/16) = Sample under construction

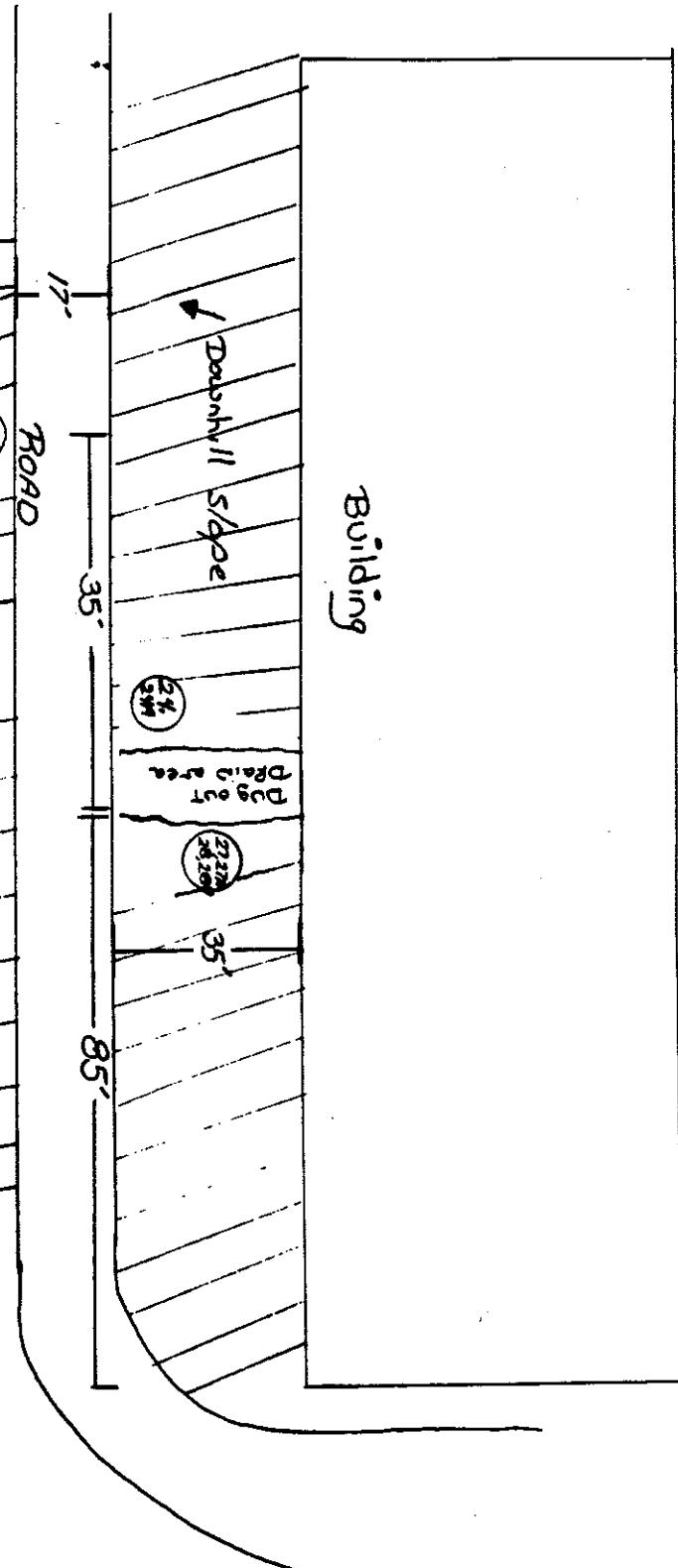
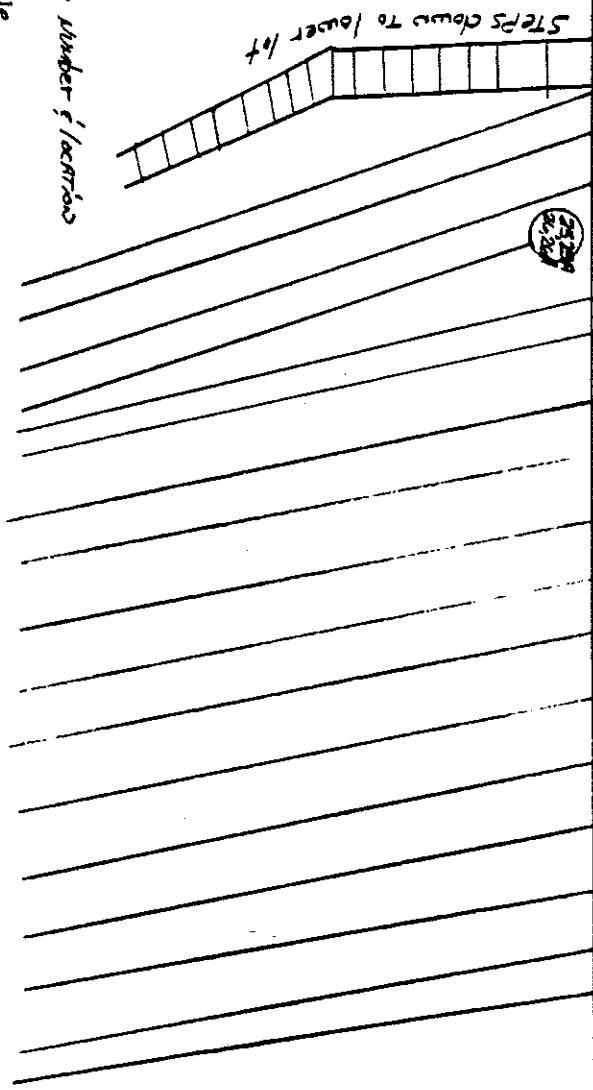


FIG-1

TABLE 1

ANALYTICAL METHODS REFERENCE  
 LOWER LOT SOIL SAMPLES  
 PLATING OPERATIONS BUILDING  
 UNION SWITCH AND SIGNAL  
 SWISSVALE, PENNSYLVANIA

METHOD TITLE	REFERENCE
Inductively Coupled Plasma-Atomic Emissions Spectrometric Method for Trace Element Analysis of Water and Waste	Method 200.7, <u>Methods for the Chemical Analysis of Water and Waste</u> , United States Environmental Protection Agency - 600/4-79-020, 1983 Revision.
Arsenic (Atomic Absorption, Furnace Technique)	Method 206.2, <u>Methods for the Chemical Analysis of Water and Waste</u> , United States Environmental Protection Agency - 600/4-79-020, 1983 Revision.
Mercury (Manual Cold Vapor Technique)	Method 245.1, <u>Methods for the Chemical Analysis of Water and Waste</u> , United States Environmental Protection Agency - 600/4-79-020, 1983 Revision.
Chromium (Hexavalent)	Method 312B, <u>Standard Methods for the Examination of Water and Wastewater</u> , American Public Health Association, 16th Ed., 1985.
Cyanide, Total (Titrimetric, Spectrophotometric)	Method 335.2, <u>Methods for the Chemical Analysis of Water and Waste</u> , United States Environmental Protection Agency - 600/4-79-020, 1983 Revision.
Extraction Procedure (EP) Toxicity Test Method and Structural Integrity Test	Method 1310, <u>Test Methods for Evaluating Solid Waste</u> , U.S. EPA SW-846 3rd Ed., 1986.
Mercury, Manual Cold Vapor	Method 7040, <u>Test Methods for Evaluating Solid Waste</u> , U.S. EPA SW-846 3rd Ed., 1986.
Total and Amenable Cyanide (Colorimetric Method)	Method 9010, <u>Test Methods for Evaluating Solid Waste</u> , U.S. EPA SW-846 3rd Ed., 1986.
Volatile Organic Analysis (VOA), Hazardous Substance List (HSL)	Method 8240 Gas Chromatographic/ Mass Spectroscopy Method, Test Methods for Evaluation of Solid Waste (U.S. EPA SW-846, 3rd Edition, 1986)
Base Neutral Acid Extractables (BNAE), Hazardous Substance List (HSL)	Method 8250 Gas Chromatographic/ Mass Spectroscopy Method, Test Methods for Evaluation of Solid Waste (U.S. EPA SW-846, 3rd Edition, 1986)

TABLE 2  
EP TOXICITY LEACHATE ANALYSES (a) SUMMARY  
LOWER LOT SOIL SAMPLES (b)  
UNION SWITCH AND SIGNAL  
SWISSEVALE, PENNSYLVANIA

EP TOX METAL CONCENTRATION (mg/l) (c)

SAMPLE I.D.	ARSENIC	BARIUM	CADMIUM	CHROMIUM (HEXAVALENT)	LEAD	MERCURY	SELENIUM	SILVER
US-1	<0.005/<0.005(d,e)	1.1/1.3	0.049/0.036	<0.01/<0.01	0.03/0.04	0.08/0.11	<0.0002/<0.002	<0.005/<0.005
US-2	<0.005	0.04	<0.005	<0.01	<0.01	<0.05	<0.0002	<0.005
US-3	<0.005	0.27	0.011	<0.02	<0.02	<0.05	<0.0002	<0.005
US-4	<0.005	0.07	<0.005	<0.01	0.02	<0.05	<0.0002	<0.005
US-5	<0.005	0.16	<0.005	<0.01	0.03	<0.05	0.0003	<0.005
US-6	<0.005	0.05	<0.005	<0.01	0.02	<0.05	<0.0002	<0.005
US-7	<0.005	0.42	<0.005	<0.01	0.03	<0.05	<0.0002	<0.005
US-8	<0.005	0.04	<0.005	<0.01	0.02	<0.05	0.0004	<0.005
US-9	<0.005	0.04	<0.005	<0.01	<0.01	<0.05	<0.0002	<0.005
US-10	<0.005/<0.005	0.28/0.25	0.009/0.006	<0.01/<0.01	<0.01/<0.01	<0.05/<0.05	<0.0002	<0.005
US-11	<0.005	0.13	<0.005	<0.01	<0.01	<0.05	<0.0002	<0.005
US-12	<0.005	0.01	<0.005	<0.01	<0.01	<0.05	<0.0002	<0.005
US-13	<0.005	0.01	<0.005	<0.01	<0.01	<0.05	0.0003	<0.005
US-14	<0.005	0.23	0.008	<0.01	0.05	0.07	<0.0002	<0.005
US-15	<0.005	0.46	0.049	<0.01	0.05	0.09	<0.0002	<0.005
US-16	<0.005	0.01	<0.005	<0.01	<0.01	<0.05	<0.0002	<0.005
US-17	<0.005	0.15	<0.005	<0.01	0.02	<0.05	0.0009	<0.005
US-18	<0.005	0.64	0.006	<0.01	0.04	0.26	0.0036	<0.005
US-19	<0.005	1.5	0.11	<0.01	0.02	0.06	0.001	<0.005
US-20	<0.005	0.27	<0.005	<0.01	<0.01	0.05	0.0005	<0.005
US-21	<0.005	0.64	<0.005	0.01	<0.01	<0.05	0.0008	<0.005
US-22	<0.005	0.11	<0.005	<0.01	<0.01	<0.05	0.0003	<0.005
US-23	<0.005	0.58	0.008	<0.01	0.05	0.13	0.0009	0.005
US-24	<0.005	0.21	0.026	<0.01	0.01	<0.05	0.0006	<0.005
US-25	<0.005	0.14	<0.005	0.01	0.02	<0.05	<0.0002	<0.005
US-26	<0.005/<0.005	0.39/0.43	0.007/0.011	<0.01/<0.01	0.04/0.04	0.05/0.06	0.0003/0.0005	<0.005
US-27	<0.005	0.01	<0.005	0.05	<0.01	<0.05	0.0005	<0.005
US-28	<0.005	0.01	<0.005	0.01	<0.01	<0.05	0.0004	<0.005

(a) Pursuant to Code of Federal Regulation (CFR) 260.20 and 260.21.

(b) For sampling locations, refer to Figure 1.

(c) mg/l = milligrams per liter or parts per million (ppm).

(d) "<" indicates method detection limit at the indicated value.

(e) Sample was analyzed in duplicate for indicated parameter.

**TABLE 3**  
**SOIL ANALYSIS SUMMARY**  
**OF VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS**  
**FOR UNION SWITCH & SIGNAL**  
**PROJECT NO. 305253**

PARAMETER	CAS NUMBER (1)	US-1A	US-2A	US-3A	US-4A	US-5A	US-6A	US-7A	SAMPLE IDENTIFICATION	
									Concentration µg/kg (2)	
<b>Acetone (3)</b>	<b>67-64-1</b>	<100	<100/<100 (4)	410	300	440	150	<100/370		
Benzene	71-43-2	<50	<50/<50	<50	<50	<50	<50	<50/<50		
2-Butanone	78-93-3	<100	<100/<100	<100	<100	<100	<100	<100/<100		
Bromoform	75-25-2	<50	<50/<50	<50	<50	<50	<50	<50/<50		
Carbon disulfide	75-15-0	<50	<50/<50	<50	<50	<50	<50	<50/<50		
Carbon tetrachloride	56-23-5	<50	<50/<50	<50	<50	<50	<50	<50/<50		
Chlorobenzene	108-90-7	<50	<50/<50	<50	<50	<50	<50	<50/<50		
Chlorodibromomethane	124-48-1	<50	<50/<50	<50	<50	<50	<50	<50/<50		
Chloroethane	75-00-3	<100	<100/<100	<100	<100	<100	<100	<100/<100		
2-Chloroethylvinyl ether	110-75-8	<100	<100/<100	<100	<100	<100	<100	<100/<100		
Chloroforn	67-66-3	<50	<50/<50	<50	<50	<50	<50	<50/<50		
Cis-1,3-dichloropropene	10061-01-5	<50	<50/<50	<50	<50	<50	<50	<50/<50		
Dichlorobromomethane	75-27-4	<50	<50/<50	<50	<50	<50	<50	<50/<50		
1,1-Dichloroethane	75-34-3	<50	<50/<50	<50	<50	<50	<50	<50/<50		
1,2-Dichloroethane	107-06-2	<50	<50/<50	<50	<50	<50	<50	<50/<50		
1,1-Dichloroethylene	75-35-4	<50	<50/<50	<50	<50	<50	<50	<50/<50		
1,2-Dichloropropane	78-87-5	<50	<50/<50	<50	<50	<50	<50	<50/<50		
Ethylbenzene	100-41-4	<50	<50/<50	<50	<50	<50	<50	<50/<50		

TABLE 3  
(Continued)

PARAMETER	CAS NUMBER (1)	SAMPLE IDENTIFICATION						US-7A
		US-1A	US-2A	US-3A	US-4A	US-5A	US-6A	
2-Hexanone	591-78-6	<100	<100/<100	<100	<100	<100	<100	<100/<100
Methyl bromide	74-83-9	<100	<100/<100	<100	<100	<100	<100	<100/<100
Methyl chloride	74-87-3	<100	<100/<100	<100	<100	<100	<100	<100/<100
Methylene chloride (3)	75-09-2	<100	<100/<100	<100	<100	<100	<100	<100/<170
4-Methyl-2-pentanone	108-10-1	<100	<100/<100	<100	<100	<100	<100	<100/<100
Styrene	100-42-5	<50	<50/<50	<50	<50	<50	<50	<50/<50
1,1,2,2-Tetrachloroethane	79-34-5	<50	<50/<50	<50	<50	<50	<50	<50/<50
Tetrachloroethylene	127-18-4	<50	<50/<50	<50	<50	<50	<50	<50/<50
Toluene	108-80-3	<50	<50/<50	<50	<50	<50	<50	<50/<50
trans-1,2-Dichloropropene	156-60-5	<50	<50/<50	<50	<50	<50	<50	<50/<50
trans-1,3-Dichloropropene	10061-02-6	<50	<50/<50	<50	<50	<50	<50	<50/<50
1,1,1-Trichloroethane	71-55-6	<50	<50/<50	<50	<50	<50	<50	<50/<50
1,1,2-Trichloroethane	79-00-5	<50	<50/<50	<50	<50	<50	<50	<50/<50
Trichloroethylene	79-01-6	<50	<50/<50	<50	<50	<50	<50	<50/<50
Vinyl acetate	108-05-4	<100	<100/<100	<100	<100	<100	<100	<100/<100
Vinyl chloride	75-01-4	<100	<100/<100	<100	<100	<100	<100	<100/<100
Total xylenes	95-47-6	<50	<50/<50	<50	<50	<50	<50	<50/<50

TABLE 3  
(continued)

PARAMETER	CAS NUMBER (1)	US-22A	US-23A	US-24A	SAMPLE IDENTIFICATION		US-27A	US-28A
					Concentration µg/kg (2)	µg/kg (2)		
2-Hexanone	591-78-6	<100	<100	<100	<100	<100	<100	<100
Methyl bromide	74-83-9	<100	<100	<100	<100	<100	<100	<100
Methyl chloride	74-87-3	<100	<100	<100	<100	<100	<100	<100
Methylene chloride (3)	75-09-2	<100	<100	<100	<100	<100	<100	<100
4-Methyl-2-pentanone	108-10-1	<100	<100	<100	<100	<100	<100	<100
Styrene	100-42-5	<50	<50	<50	<50	<50	<50	<50
1,1,2,2-Tetrachloroethane	79-34-5	<50	<50	<50	<50	<50	<50	<50
Tetrachloroethylene	127-18-4	<50	<50	<50	<50	<50	<50	<50
Toluene	108-88-3	<50	<50	<50	<50	<50	<50	<50
trans-1,2-Dichloroethylene	156-60-5	<50	<50	<50	<50	<50	<50	<50
trans-1,3-Dichloropropene	10061-02-6	<50	<50	<50	<50	<50	<50	<50
1,1,1-Trichloroethane	71-55-6	<50	<50	<50	<50	<50	<50	<50
1,1,2-Trichloroethane	79-00-5	<50	<50	<50	<50	<50	<50	<50
Trichloroethylene	79-01-6	<50	<50	180	<50	<50	<50	<50
Vinyl acetate	108-05-4	<100	<100	<100	<100	<100	<100	<100
Vinyl chloride	75-01-4	<100	<100	<100	<100	<100	<100	<100
Total xylenes	95-47-6	<50	<50	<50	<50	<50	<50	<50

(1)The numbers presented in this column are the Chemical Abstracts Service (CAS) numbers used for cataloging the indicated compounds in the Chemical Abstracts Index.

(2)µg/kg = micrograms per kilogram or parts per billion.

(3)The compound is a common laboratory contaminant. Although the method blank values have been subtracted, results just above the detection limit should be considered suspect.

(4)The indicated samples were analyzed in duplicate.

TABLE 4  
SOIL ANALYSIS SUMMARY  
OF SEMIVOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS  
FOR UNION SWITCH & SIGNAL  
PROJECT NO. 305253

TABLE 4  
(Continued)

PARAMETER	CAS NUMBER (1)	SAMPLE IDENTIFICATION						US-27	US-28
		US-22	US-23	US-24	US-25	US-26	Concentration µg/kg (2)		
Indeno(1,2,3-cd)pyrene	193-39-5	<330	<330	<330	<330	<330	<330	<330	<330
Isophorone	78-59-1	<330	<330	<330	<330	<330	<330	<330	<330
2-Methylnaphthalene	91-57-6	<330	<330	<330	<330	<330	<330	<330	<330
2-Methylphenol	95-48-7	<330	<330	<330	<330	<330	<330	<330	<330
4-Methylphenol	106-44-5	<330	<330	<330	<330	<330	<330	<330	<330
Naphthalene	91-20-3	<330	<330	<330	<330	<330	<330	<330	<330
2-Nitroaniline	88-74-4	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600
3-Nitroaniline	99-09-2	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600
4-Nitroaniline	100-01-6	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600
Nitrobenzene	98-95-3	<330	<330	<330	<330	<330	<330	<330	<330
2-Nitrophenol	88-75-5	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600
4-Nitrophenol	100-02-7	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600
N-Nitrosodimethylamine	621-64-7	<330	<330	<330	<330	<330	<330	<330	<330
N-Nitrosodiphenylamine (Diphenylamine)	86-30-6	<330	<330	<330	<330	<330	<330	<330	<330
p-Chloro-m-cresol	59-50-7	<330	<330	<330	<330	<330	<330	<330	<330
Pentachlorophenol	87-86-5	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600
Phenanthrene	85-01-8	750	<330	<330	<330	<330	<330	<330	<330
Phenol	108-95-2	<330	<330	<330	<330	<330	<330	<330	<330
Pyrene	129-00-0	570	<330	<330	<330	<330	<330	<330	<330
1,2,4-Trichlorobenzene	120-82-1	<330	<330	<330	<330	<330	<330	<330	<330
2,4,5-Trichlorophenol	95-95-4	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600
2,4,6-Trichlorophenol	88-06-2	<330	<330	<330	<330	<330	<330	<330	<330

(1) The numbers presented in this column are the Chemical Abstracts Service (CAS) numbers used for cataloging the indicated compounds in the Chemical Abstracts Index.

(2) µg/kg = micrograms per kilogram or parts per billion.

(3) Detected as compound in parentheses.